

WHAT IS CLAIMED IS:

1. A process for the fluidized catalytic cracking of a hydrocarbon feedstock comprising:

passing a hydrocarbon feedstock and solid catalyst particles into a reaction

5 conduit to produce a mixture of solid catalyst particles and gaseous fluids;

inducing said mixture of said catalyst particles and gaseous fluids to swirl in a

first angular direction to decrease the catalyst particle concentration and

increase the gaseous fluids concentration in said mixture;

transporting said mixture to at least one cyclone; and

10 inducing said mixture in said cyclone to swirl in a second angular direction that

is counter to the first angular direction to further decrease the catalyst

particle concentration and further increase the gaseous fluids concentration

in said mixture.

2. The process of claim 1 wherein said mixture exits said reaction conduit

15 through a swirl arm to induce swirling in said first angular direction.

3. The process of claim 1 wherein said mixture is transported from said reaction conduit to said cyclone in a gas recovery conduit.

4. The process of claim 3 wherein said cyclone directly communicates with said gas recovery conduit.

5. The process of claim 1 wherein said mixture exits from said reaction conduit into a separation vessel and said gas recovery conduit directly communicates with said separation vessel.

6. The process of claim 1 further including depositing catalyst particles removed from said mixture in said cyclone into a stripping zone, contacting said catalyst particles with a stripping gas in said stripping zone, recovering stripped catalyst particles from said stripping zone and collecting gaseous fluids from said stripping zone.

7. The process of claim 1 wherein said mixture continues to swirl in said first angular direction while it is transported to the cyclone.

8. An apparatus for the fluidized catalytic cracking of a hydrocarbon feedstock comprising:

a reaction conduit for contacting a hydrocarbon feedstock and solid catalyst particles to produce a mixture of solid catalyst particles and gaseous fluids, said reaction conduit having a swirl exit configured to induce the solid catalyst particles and gaseous fluids to swirl in a first angular direction; and a cyclone in communication with said swirl exit, said cyclone having a swirl inducing outer wall that induces the solid catalyst particles and gaseous fluids to swirl in a second angular direction that is counter to the first angular direction.

9. The apparatus of claim 8 wherein the swirl exit comprises a tubular swirl arm with one end connective with the reaction conduit and an opening at the opposite end.

10. The apparatus of claim 9 wherein said swirl arm curves about an axis that is parallel to said reaction conduit.

11. The apparatus of claim 10 wherein said opening at said opposite of said swirl arm defines a swirl direction toward said swirl inducing outer wall of said cyclone.

12. The apparatus of claim 8 wherein the swirl exit is positioned in a separation vessel.

13. The apparatus of claim 8 wherein a gas recovery conduit communicates the swirl exit of the reaction conduit with the cyclone.

14. The apparatus of claim 8 wherein said cyclone includes a centrally disposed gas outlet and the first angular direction of swirl induced by the swirl exit of the reaction conduit is primarily toward said swirl-inducing outer wall at an inlet to the cyclone.

15. The apparatus of claim 8 which is a part of an entire fluidized catalytic cracking unit.

16. An apparatus for the fluidized catalytic cracking of a hydrocarbon feedstock comprising:

a reaction conduit for contacting a hydrocarbon feedstock and solid catalyst particles to produce a mixture of solid catalyst particles and gaseous fluids,

said reaction conduit having a curved tubular swirl arm connective with said reaction conduit and an open exit end; and

a cyclone in communication with said open exit end of said swirl arm, said cyclone having a curved outer wall; wherein said swirl arm curves in an angular orientation counter to the angular orientation in which said outer wall of the cyclone curves.

17. The apparatus of claim 16 wherein said swirl arm curves about an axis that is parallel to said reaction conduit.

18. The apparatus of claim 16 wherein the open exit end is positioned in a separation vessel.

19. The apparatus of claim 16 wherein a gas recovery conduit communicates the open exit end of the swirl arm with the cyclone.

20. The apparatus of claim 16 which is a part of an entire fluidized catalytic cracking unit.